#5 UNIFORM MOTION → CONSTANT VELOCITY
→ SPEED DOES NOT CHANGE → MAGNITUDE OF VEL. = SPEED
→ DIRECTION DOES NOT CHANG

#6 $\Delta\vec{d} = 50.0\text{m [fwd]}$
$\Delta t = 16.9\text{s}$
$\vec{v} = ?$

$\vec{v} = \frac{\Delta\vec{d}}{\Delta t} = \frac{50.0}{16.9}$
$= 2.96\text{m/s [fwd]}$

#7 (a) $\vec{v} = \frac{\Delta\vec{d}}{\Delta t}$
$\therefore \Delta\vec{d} = \vec{v}\Delta t$

(b) $\vec{v} = \frac{\Delta\vec{d}}{\Delta t}$
$\therefore \Delta t = \Delta\vec{d}/\vec{v}$

#8 $\vec{v} = 2.4\text{mm/s [fwd]}$
$\Delta\vec{d} = ?$
$\Delta t = 140\text{s}$

$\vec{v} = \frac{\Delta\vec{d}}{\Delta t}$
$\therefore \Delta\vec{d} = \vec{v}\Delta t$
$= (2.4)(140)$
$= 33.6\text{ cm [fwd]}$

#9 $\vec{v} = 20.8\text{m/s [fwd]}$
$t = ?$
$\Delta\vec{d} = 178\text{ m [fwd]}$

$\vec{v} = \frac{\Delta\vec{d}}{\Delta t}$
$\therefore \Delta t = \frac{\Delta\vec{d}}{\vec{v}}$
$= 178/20.8$
$= 8.56\text{s}$

p.16

#12 Graph shown is a position-time graph
→ slope yields velocity information

(a) slope = $\frac{\text{rise}}{\text{run}}$

$= \frac{(15-0)}{(0.1-0)}$

$= 150\ m/s\ [E]$

(b) slope = $\frac{\text{rise}}{\text{run}}$

$= \frac{(10-5)}{(0.3-0.2)}$

$= 50\ m/s\ [E]$

(c) slope = $\frac{\text{rise}}{\text{run}}$

$= \frac{(10-20)}{(0.4-0.2)}$

$= -50\ m/s\ [E]$

$= 50\ m/s\ [W]$

#13 Graph shown is a velocity-time graph
→ Slope = acceleration
Area = displacement

(a) Area = l x w

$= 40\ m/s\ [N] \times 3.0$

$= 120\ m\ [N]$

(b) Area = l x w

$= 30\ m/s\ [N] \times 4.0$

$= 120\ m\ [N]$

(c) Area = l x w

$= -15\ (8.0)$

$= -120\ m\ [$ ~~N~~ $]$

$= 120\ m\ [S]$

p.17 $\vec{v} = 3.3\ km/h\ [W]$

#4 $t = ?$

$\Delta\vec{d} = 8.00 \times 10^3\ km\ [W]$

$t = \frac{\Delta\vec{d}}{\vec{v}}$

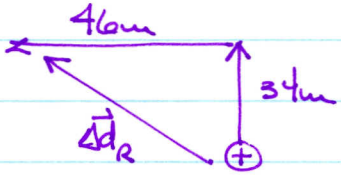
$= \frac{8000}{3.3}$

$= 2424.24\ h$

$= 101\ days.$

#4 $\Delta\vec{d}_R = \Delta\vec{d}_1 + \Delta\vec{d}_2$

$= 34m[N] + 46m[W] = 57.2m\ [N53.5°W]$



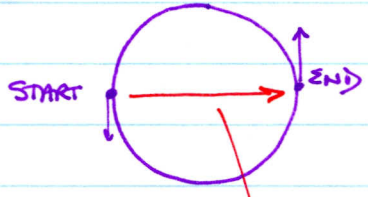
$|\Delta\vec{d}_R| = \sqrt{34^2 + 46^2}$

$= 57.2m$

$\theta = \tan^{-1}\left(\frac{46}{34}\right)$

$= 53.5°$

#5



$t = 13s$

Speed

$v_{avg} = \frac{\text{TOTAL DISTANCE}}{\text{TIME}}$

$= \frac{(200/2)}{13}$

$= 7.69 m/s$

change in position

$\vec{v}_{avg} = \frac{\Delta\vec{d}}{\Delta t}$

Circumference $= 2\pi R$

$= \pi d$

$200 = \pi d$

$d = 200/\pi$

$=$ diameter

$= 63.66m$ [RIGHT]

$\therefore \vec{v}_{avg} = \frac{63.66m\ [R]}{13}$

$= 4.90 m/s\ [R]$

p. 49 #2 $V = 3.0 \times 10^8$ m/s

$t = 2.51$ s ← time for signal to go there and back.

$\Delta d = ?$

$$V = \frac{\Delta d}{\Delta t}$$

$$\Delta d = vt$$

$$= 7.53 \times 10^8 \text{ m} \leftarrow \text{round trip}$$

$$\therefore \Delta d_{E\text{-}m} = 7.53 \times 10^8 / 2 = 3.765 \times 10^8 \text{ m}$$

#3 $V = 112$ m/s

$\Delta d = 12.5$ km

$= 12500$ m

$t = ?$

$$V = \frac{\Delta d}{\Delta t}$$

$$112 = \frac{12500}{t}$$

$$t = \frac{12500}{112} = 111.6 \text{ s}$$

#4 (b) $V_{avg} = \frac{\Delta d}{\Delta t}$ ← distance

$$= \frac{4.5 + 2.5 + 1.5}{2}$$

$$= \frac{8.50}{2} = 4.25 \text{ h}$$

(c) $\vec{V}_{avg} = \frac{\Delta \vec{d}}{\Delta t}$ ← displacement

$\Delta \vec{d} = \Delta \vec{d}_1 + \Delta \vec{d}_2 + \Delta \vec{d}_3$

$= 4.5\text{km}[E] + 2.5\text{km}[S] + 1.5\text{km}[W]$

$= 3.0\text{km}[E] + 2.5\text{km}[S]$

$$\vec{V}_{avg} = \frac{\Delta \vec{d}}{\Delta t}$$

$$= \frac{3.91\,[E40°S]}{2}$$

$$= 1.96\text{ km/h}\,[E40°S]$$

$|\Delta \vec{d}| = \sqrt{3^2 + 2.5^2}$

$= 3.91$ km

$\theta = \tan^{-1}\left(\frac{2.5}{3.0}\right)$

$= 40°$